

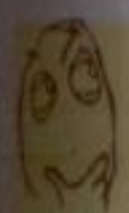
Transporting electricity over long distances would also become much easier, which is particularly useful for renewable energy applications – and some have proposed giant superconducting cables linking Europe with solar energy farms in North Africa.

The fact that superconductors will levitate above a strong magnet also creates possibilities for efficient, ultra-high speed trains that float above a magnetic track, much like Marty McFly's hoverboard in *Back to the Future*. Japanese engineers have experimented with replacing the wheels of a train with large superconductors that hold the carriages a few centimetres above the track. The idea works in principle, but suffers from the fact that the trains need to carry expensive tanks of liquid helium with them in order to keep the superconductors cold.

Many superconducting technologies will probably remain on the drawing board, or too expensive to implement, unless a room temperature superconductor is discovered. It's just possible however that the advances made by Kresin's group might mark a milestone on this journey.

► **Activity 1:** Now that you have read the text, try to answer the following questions:

1. Which substances have superconducting properties, according to the text?
2. Are superconducting properties only exhibited by pure elements or by compounds as well?
3. What enables mercury and lead to be used as superconductors?
4. How are superconductors already used in medicine?
5. What force is exerted when a superconductor is placed near a magnet?
6. What are the challenges in the area of research involving superconductors?
7. What is the advantage of the tiny clusters of atoms used experimentally by Vitaly Kresin and his coworkers?
8. In what kind of trains could superconductors be very useful in the future?
9. Why is replacing the wheels of a train with large superconductors a problem?
10. Why is cooling down a superconductor a major problem?
11. Is the writer optimistic, pessimistic or rather sceptical about the future use of superconductors?
12. *Genre and register awareness:* Can you identify in the article some phrases and other features that are not typical of formal academic texts?



To get you thinking...

"A superconductor conducts electricity perfectly, meaning an electrical current in a superconducting wire would continue to flow round in circles for billions of years, never degrading or dissipating":

Why would producing high voltage power lines from superconducting materials be most welcome?

Personifying...

► In the popularized article we can see two instances of personification which, along with analogy, is often used by writers addressing non-specialist readers, in order to make difficult concepts clear. Below, you can see one of the two instances. Can you find the second one?



- ❖ Solo electrons get stuck in traffic, ... as they make their journey...